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**COMPOSITION AND METHOD FOR DETERRING RODENTS**

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This invention relates to a method for the deterrence of rodents, to a composition for this purpose, and to an animal food treated with such a composition. More particularly, it relates to a method, a composition, and 10 animal food intended to repel the grey squirrel (*Sciurus carolinensis*).

Although the grey squirrel was introduced into Britain more than a century ago, it is only in the last two or 15 three decades that it has become so widespread through large areas of the country as to become a major pest, and almost entirely to replace the native red squirrel (*Sciurus vulgaris*).

20 The problem of this infestation has become more prevalent because of the increasing practice of putting out food, such as nuts and seeds, intended to attract wild birds to gardens. The grey squirrel is a very efficient forager, and has become very efficient at finding out how to take 25 food from bird feeders. There have even been television programmes displaying their ingenuity and capacity for learning how to circumvent quite complicated barriers.

30 Although they are not unattractive to the sight, they can constitute a health and economic hazard. As rodents, they are vehicles for the transmission of a variety of bacterial and viral infections, which may be transmitted to humans or domestic animals which come into contact with their urine or faeces. They may also be hosts to

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ticks or fleas which may then be transferred to domestic pets. They can, moreover cause severe structural damage to buildings if they should gain access to roof spaces. In addition, they can very readily multiply domestic expenditure on bird seed and nuts.

5 Various methods have been adopted to deter these pests. For instance there are various barrier systems and traps, but these have been found to be costly and to have only 10 limited effectiveness. Chemical methods have also been proposed, but these also have a number of practical disadvantages. For instance, one method that has been employed is to sprinkle finely ground black pepper or capsicum seed around areas where squirrels enter or 15 congregate. Although this can be effective, in that squirrels are repelled, there is the disadvantage that long term deterrence has proved difficult for practical reasons. Powders are not easily applied to areas that are exposed, not flat, or inaccessible. For instance, powders 20 cannot be applied to vertical or steeply-sloping areas, such as walls or roofs, or to bird food hanging in vertical nets or cages. Even when applied to horizontal surfaces, such as bird tables, the tops of walls or fences, the roofs of sheds etc., long term protection is 25 difficult or impossible, because even slight breezes will disperse the powder, and render it ineffective. There is therefore a need for a simple means of deterring squirrels or other rodents which is effective and long lasting, and which imposes no health hazards to humans, 30 domestic pets or to bird life. The present invention provides a simple means of meeting these requirements.

In one embodiment the present invention provides a rodent-deterrant composition which comprises:

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- (a) a capsicum oleoresin,
- (b) a polyoxyethylene sorbitan fatty acid ester,
- (c) a fatty acid triglyceride, and
- (d) water.

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Preferably the composition according to the invention comprises:

(a) from 0.10 to 10.00 %w/w of the capsicum oleoresin,

10 (b) from 0.15 to 15.00 %w/w of the polyoxyethylene sorbitan fatty acid ester,

(c) from 0.15 to 15.00 %w/w of the fatty acid triglyceride, and

(d) from 60.00 to 99.60 %w/w of water.

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More preferably, the composition comprises:

(a) from 0.10 to 0.50 %w/w of the capsicum oleoresin,

(b) from 0.15 to 0.75 %w/w of the polyoxyethylene sorbitan fatty acid ester,

20 (c) from 0.15 to 0.75 %w/w of the fatty acid triglyceride, and

(d) from 98.00 to 99.60 %w/w of water.

25 The capsicum oleoresin is obtained by extraction in known manner of the fruits of *Capsicum annum* L. or *Capsicum frutescens* L. or other *Capsicum* species.

30 Suitable polyoxyethylene sorbitan fatty acid esters include oleic acid esters and palmitic acid esters. Examples of suitable commercially available esters include:

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Surfacare T20<sup>RTM</sup>: Sorbitan trioleate ester with 20 units  
(moles) ethylene oxide, (EO)

Crillet 4<sup>RTM</sup>: Sorbitan monooleate ester with 20 units  
EO

5 Tween 4<sup>RTM</sup>: Sorbitan monopalmitate ester with 20 units  
EO

Tween 85<sup>RTM</sup>: Sorbitan trioleate ester with 20 units EO

According to another embodiment, the invention provides a  
10 method of rendering a bird feed, such as seeds, nuts or a  
fat ball, deterrent to rodents which comprises applying a  
composition as described above.

A suitable commercially available saturated fatty acid  
15 triglyceride is Surfac MCTG, a C<sub>8</sub> - C<sub>10</sub> saturated fatty  
acid triglyceride.

The compositions according to the invention are oil-in-  
water emulsions which have moderate phase stability and a  
20 large droplet size, giving good overall coverage of  
treated areas. They combine non-toxicity, due to the use  
of low levels of the capsicum oil and of two surfactants,  
which are of food grade and are fully biodegradable. They  
are thus able to combine convenience and effectiveness in  
25 use with a high initial activity and low environmental  
impact.

In the formation of the emulsions, use is made of two  
surfactants, component (b) acting as the primary  
30 emulsifier, while component (c) acts as secondary  
emulsifier. It is found that the combination of the two  
surfactants provides the most acceptable emulsion  
characteristics.

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It is found that the compositions according to the invention are effective in deterring rodents, such as grey squirrels, while being palatable to garden birds.

- 5 If desired, other ingredients, such as food grade dyes, may be incorporated into the compositions for special purposes.

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**CLAIMS**

1 A rodent-deterrant composition which comprises:

- (a) a capsicum oleoresin,
- (b) a polyoxyethylene sorbitan fatty acid ester,
- (c) a fatty acid triglyceride, and
- (d) water.

2 A composition according to claim 1 which comprises:

- (a) from 0.10 to 10.00 %w/w of the capsicum oleoresin,
- (b) from 0.15 to 15.00 %w/w of the polyoxyethylene sorbitan fatty acid ester,
- (c) from 0.15 to 15.00 %w/w of the fatty acid triglyceride, and
- (d) from 60.00 to 99.60 %w/w of water.

3 A composition according to claim 1 or 2 which comprises:

- (a) from 0.10 to 0.50 %w/w of the capsicum oleoresin,
- (b) from 0.15 to 0.75 %w/w of the polyoxyethylene sorbitan fatty acid ester,
- (c) from 0.15 to 0.75 %w/w of the fatty acid triglyceride, and
- (d) from 98.00 to 99.60 %w/w of water.

4 A composition according to any of claims 1 to 3 wherein the capsicum oleoresin is obtained by extraction of the fruits of *Capsicum annum* L. or *Capsicum frutescens* L.

5 A composition according to any one of the preceding

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claims wherein the polyoxyethylene sorbitan fatty acid ester is an oleic acid ester or a palmitic acid ester.

6 A composition according to claim 5 wherein the polyoxyethylene sorbitan fatty acid ester is a sorbitan monooleate or trioleate ester or a sorbitan monopalmitate ester, with about 20 units ethylene oxide.

7 A composition according to any one of the preceding claims wherein the fatty acid triglyceride is a C<sub>8</sub> - C<sub>10</sub> saturated fatty acid triglyceride.

8 A method of rendering a bird feed deterrent to rodents which comprises applying a composition according to any of claims 1 to 7 to the feed.

9 A method according to claim 8 wherein the bird feed comprises seeds, nuts or a fat ball.